CSC 450-750 Assignment 2

Due date: Nov 4th, 2021 by 11:59 PM

Learning Objectives:

- Creating a protocol based on different entities in the scenario.
- Correctly set up agents to satisfy the requirements.
- Ensure the safety and liveness across the whole protocol.
- Learning how enactment can be placed inside of protocol.

Scenario:

Consider each entity as an agent in the protocol.

- Buyer:
    - Submit order to eBay, with address and name as order detail
    - Send cancel order request to eBay only before item has been shipped (only available when item has not been shipped, otherwise it is failed)
    - Submit payment to eBay
    - Receive item from shipping service
    - Receive refund from eBay through PayPal for canceled order
    - Receive refund from eBay through PayPal for defective item
    - Submit review of the transaction to eBay
- eBay:
    - Receive order from buyer
    - Send payment to merchant through PayPal with hold request
    - Receive tracking number from merchant
    - Release the fund to merchant through PayPal when received delivery confirmation
    - Notify buyer the item has been shipped (after received tracking number) and cannot be canceled
    - Ask PayPal to refund buyer with withdraw request from buyer
    - Notify merchant the order has been canceled
    - Ask PayPal to refund buyer with defective notification from merchant
- PayPal:
    - Receive fund from eBay
    - Notify Merchant that payment has been put on hold
    - Release fund to merchant when eBay confirms delivery
    - Refund buyer with refund request from eBay if buyer canceled the order
    - Refund buyer with refund request from eBay if item defective
- Merchant:
    - Receives order details from eBay and payment notification from PayPal

    - Receives message from eBay saying order has been canceled, take no further action
    - Send the item to the shipper for shipment
    - Upload tracking number to eBay
    - Pass delivery confirmation from Shipping service to eBay
    - Notify eBay for defective item to refund buyer
    - Submit review of the transaction to eBay (safety and ethics violation)
- Shipping service
    - Receive order information from merchant
    - Pack and ship the item to the buyer
    - Provide tracking number to merchant
    - Confirm delivery to merchant with tracking number
    - Report defective item to merchant

Deliverables:

- A protocol in BSPL with roles corresponding to the above stakeholders and messages through which they can accomplish the specified interactions
    - The protocol would have a parameters line that expresses what information is needed to complete the transaction.
    - The protocol should be safe and live, as verified using the Protocheck tool.
    - You can find tutorial and useful packages using this link: https://gitlab.com/masr/protocheck.
- Sample agents, where each agent adopts a role in the protocol. Call these agents Buyer-A, eBay-Org, PayPal-Org, Merchant-A, Shipping-A.
    - These agents send and receive messages according to their role in the protocol. The agents should be designed so that the transaction completes.
    - These agents can be built using the Python library provided by the Protocheck toolsuite.
    - You can find tutorial and useful packages for implementing agents with this link: https://gitlab.com/masr/bungie
- Two sample enactments of the protocol as generated by the above agents interoperating (i.e., working together).
    - An enactment equals a list (also called vector) of observation sequences (also called history), one sequence or history per agent.
    - Two enactments can differ in the order of observations made by at least one agent
- An alternative agent for the Buyer role. Call this agent Buyer-B.
    - Buyer-B should interoperate with the remaining agents, i.e., eBay-Org, PayPal-Org, Merchant-A, Shipping-A.
    - One enactment involving Buyer-B that is different from any enactments generated by Buyer-A

Evaluation:

- Your protocol should provide at least two enactments in your protocol
- Each entity transmits a corresponding message based on its activity. For example, the buyer provides the item's name as a message of placing an order.
- Your protocol will be examined based both on what you write and how the participating agents enact it. Criteria are safety, liveness, and an ability to support the desired enactments.
- Your agents will be examined based on their ability to generate all legal enactments.

Grading:

1. Multiple python files with one bspl file that can be used to recreate the protocols. (60 points)
2. Ensure your protocols are safe and live. (30 points)
3. A pdf file with the explanation of your protocols. (10 points)

Submission:

Please make sure to put all of your source files and a PDF version of your README file in one folder, and store it inside of a zip file. The zip file should include your name and the abbreviation of assignment, e.g., Ezio-Mei-P2.zip. Submit this zip file by the due date on moodle.

Please use the discussion forum on Moodle for this assignment to talk about general concerns and post questions about the tool and so forth. Please do not post any part of your answers publicly; instead, send questions specific to your approach via email. When you write to Ezio, cc Professor Singh so we can try to help where possible. (As usual, we will try not to provide you solutions but will guide you where we can).